

WHAT IS CLAIMED IS:

1. An isolated nucleic acid molecule, which encodes a fluorescent protein, selected from the group consisting of:

5 (a) a nucleic acid which encodes a protein comprising the amino acid sequence as shown in SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, or 28;

(b) a nucleic acid comprising a nucleotide sequence as shown in SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, or 27;

10 (c) a nucleic acid that hybridizes under stringent conditions to the nucleic acid of (a) or (b) above;

(d) a nucleic acid that encodes a protein that has at least about 60% sequence identity to the amino acid sequence of (a) above;

(e) a nucleic acid that has at least about 55% sequence identity to the nucleotide sequence of (b) above;

15 (f) a nucleic acid which encodes a protein having at least one amino acid substitution, deletion or insertion in the amino acid sequence as shown in SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, or 28.

(g) a derivative or mimetic of the nucleic acid of (a), (b), (c), (d), (e) or (f) above;

(h) a mutant of the nucleic acid of (a), (b), (c), (d), or (e) above;

20 (i) a nucleic acid which differs from the nucleic acid of (b), (c), (d), (e), (f), (g) or (h) above due to the degeneracy of genetic code; and

(j) a fragment of the nucleic acid of (a) or (b) above.

2. The nucleic acid molecule of claim 1, wherein said nucleic acid is isolated from an organism from a phylum *Arthropoda*.

25 3. The nucleic acid molecule of claim 1, wherein said nucleic acid is isolated from an organism from a subclass *Copepoda*

4. The nucleic acid molecule of claim 1, wherein said nucleic acid is isolated from a family *Pontellidae*.

5. A vector comprising the nucleic acid molecule according to claim 1.

30 6. An expression cassette comprising (a) the nucleic acid molecule according to Claim 1; and (b) regulatory elements for the expression of said nucleic acid molecule in the desired host-cell.

7. A cell comprising the nucleic acid molecule according to claim 1, the vector according to claim 5, or the expression cassette according to claim 6.

8. A stable cell line comprising the nucleic acid molecule according to claim 1, the vector

according to claim 5, or the expression cassette according to claim 6.

9. A transgenic plant comprising the nucleic acid molecule according to claim 1, the vector according to claim 5, or the expression cassette according to claim 6.

10. A transgenic animal comprising the nucleic acid molecule according to claim 1, the vector
5 according to claim 5, or the expression cassette according to claim 6.

11. A method for producing a fluorescent protein, said method comprising (a) providing a nucleic acid molecule according to claim 1 operably linked to suitable expression regulatory elements (b) expressing the fluorescent protein from said nucleic acid molecule, and (c) isolating the protein substantially free of other proteins.

10 12. A nucleic acid molecule comprising a fragment of the nucleic acid molecule according to claim 1, said fragment encoding a peptide of at least 100 amino acids in length

13. A nucleic acid molecule having a sequence that is substantially the same as, or identical to a nucleotide sequence of at least 300 residues in length of the nucleic acid molecule according to claim 1.

15 14. An isolated fluorescent protein selected from the group consisting of:

(a) a protein comprising the amino acid sequence as shown in SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, or 28;

(b) a protein encoded by the nucleic acid molecule comprising a nucleotide sequence as shown in SEQ ID NOs: 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, or 27;

20 (c) a protein that has at least about 60% sequence identity to the amino acid sequence of (a) or (b) above;

(d) a mutant of the protein of (a), (b) or (c) above;

(e) a protein having at least one amino acid substitution, deletion or insertion in the amino acid sequence as shown in SEQ ID NOs: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, or 28.

25 (f) a derivative of the protein of (a), (b), (c), (d) or (e) above;

(g) a fragment of the protein of (a), (b), (c), (d), (e) or (f) above; and

(h) a protein having a sequence that is substantially the same as, or identical to the amino acid sequence of at least 100 residues in length of (a) or (b) above.

15. A fusion protein comprising the protein according to claim 14.

30 16. An antibody specifically binding to the protein according to claim 14.

17. A kit comprising the nucleic acid according to claim 1, the vector according to claim 5, the expression cassette according to claim 6, the protein according to claim 14, the fusion protein according to claim 15, or a means for producing the same.

18. An oligonucleotide probe or primer comprising the nucleotide sequence capable of

hybridizing to the nucleotide sequence selected from the group consisting of SEQ ID NOs. 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27.

19. A method for labeling a biological molecule, comprising coupling said biological molecule to the protein according to claim 14.

5 20. A method for labeling a cell comprising production of the protein according to claim 14 in the cell.

21. A method for labeling a cell organelle comprising production of the protein according to claim 14 fused to the suitable subcellular localization signal in the cell.

10 22. A method for analyzing a biological molecule, cell or cell organelle comprising detection of fluorescence signal from the protein according to claim 14 or 15.

23. A method for analyzing a biological molecule, cell or cell organelle comprising expression of the nucleic acid molecule according to claim 1 in a cell.

24. A method of detecting a biological molecule comprising detection of fluorescence signal from the protein according to claim 14 or 15.